

3114. Seizure onset zone localization from clinical ictal EEG in refractory epilepsy

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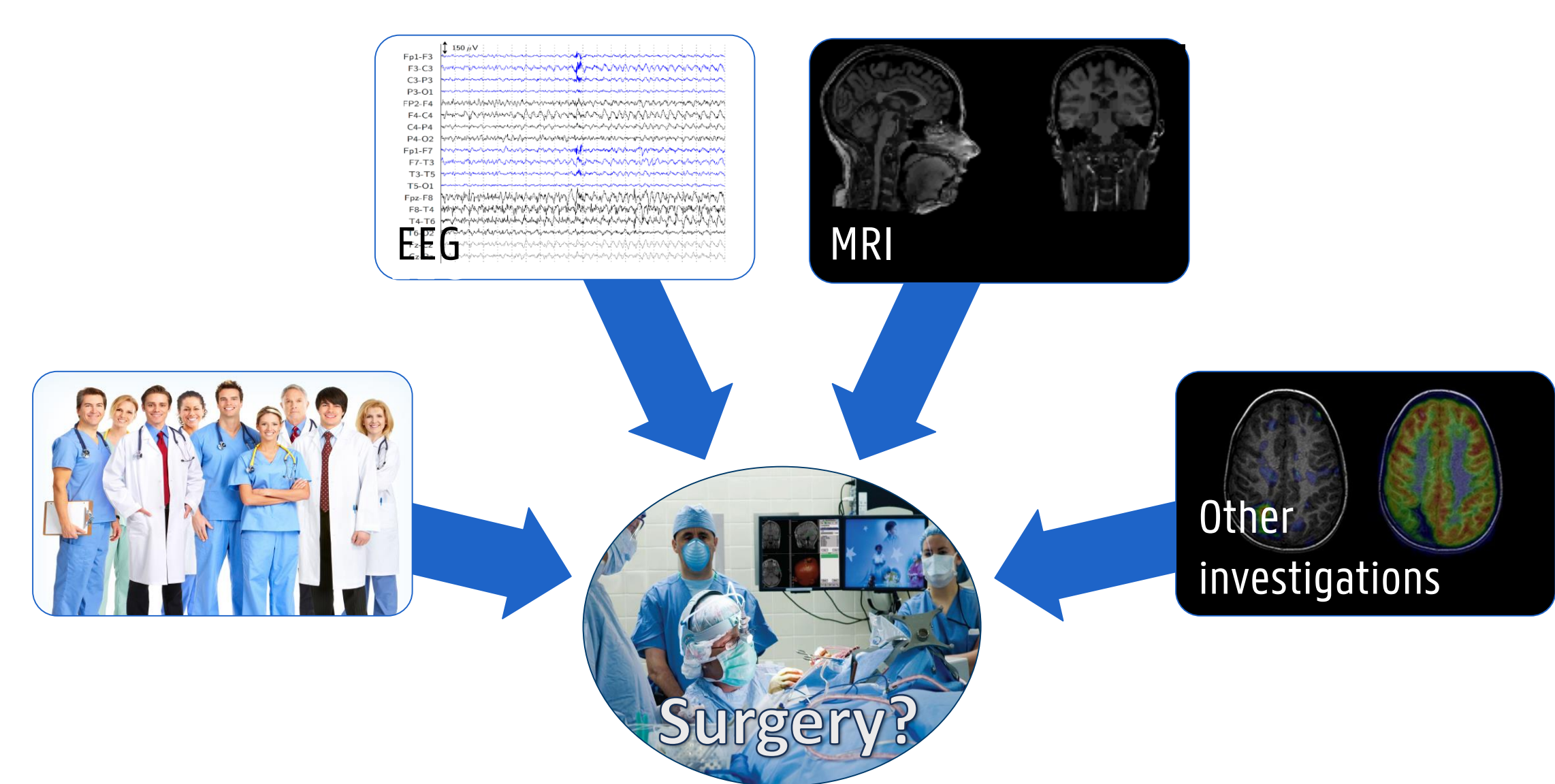
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It would be of high clinical value to be able to localize the SOZ based on non-invasive ictal EEG recordings

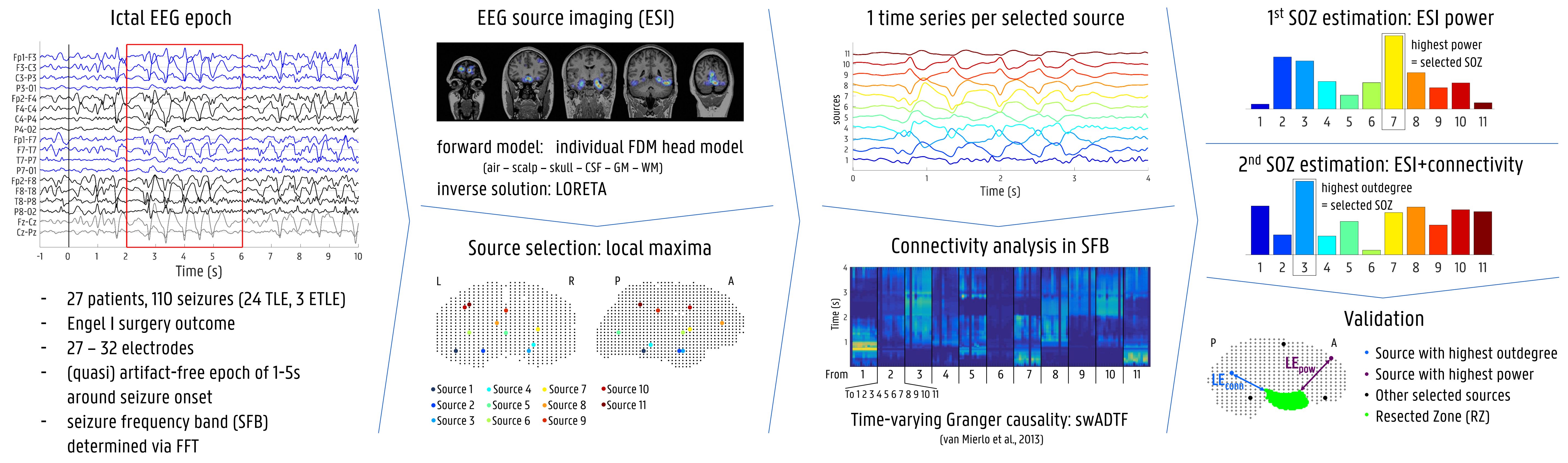
Of the 70 million epileptic patients worldwide, ± 30% cannot be helped with medication. They are referred to the presurgical evaluation: can they benefit from epilepsy surgery?

Up to now, neurologists inspect the EEG visually to localize the seizure onset zone (SOZ)

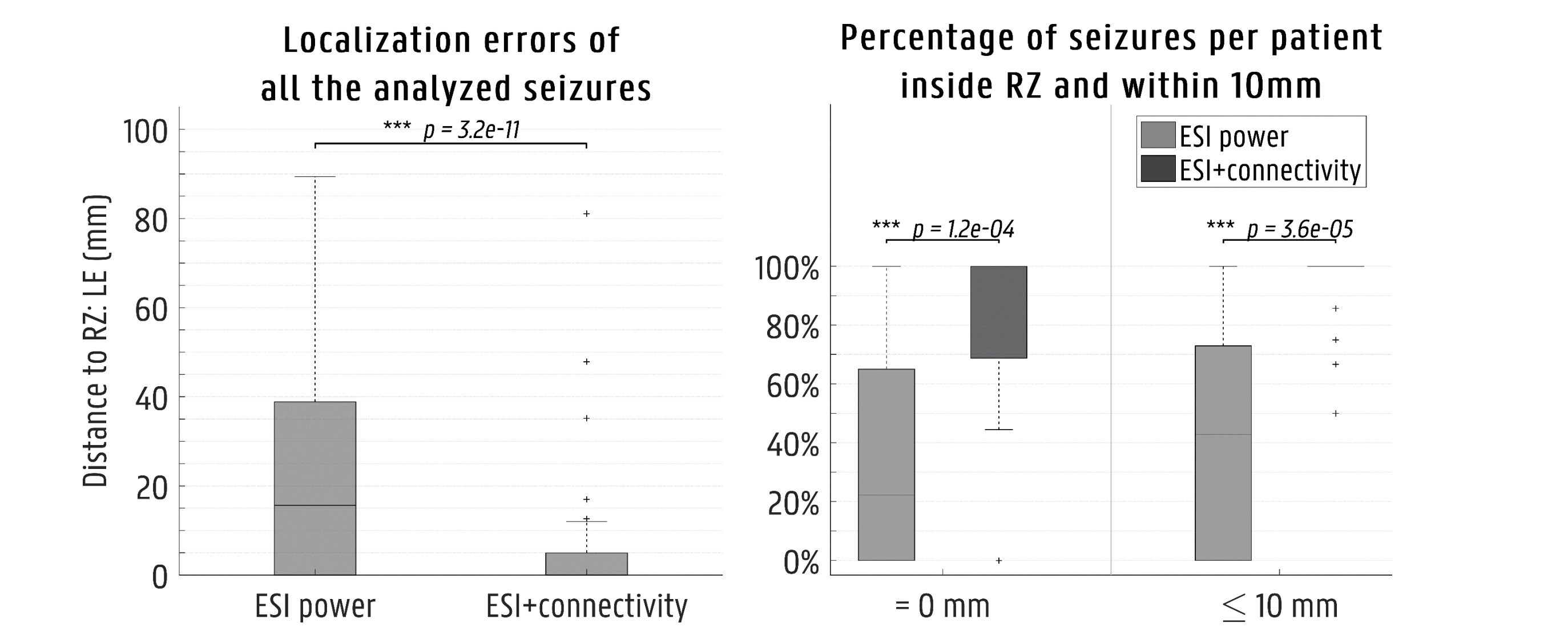
- time consuming
- labor intensive
- subjective
- sometimes invasive EEG needed: medical risks



We propose an approach for SOZ localization based on EEG source imaging and functional connectivity analysis

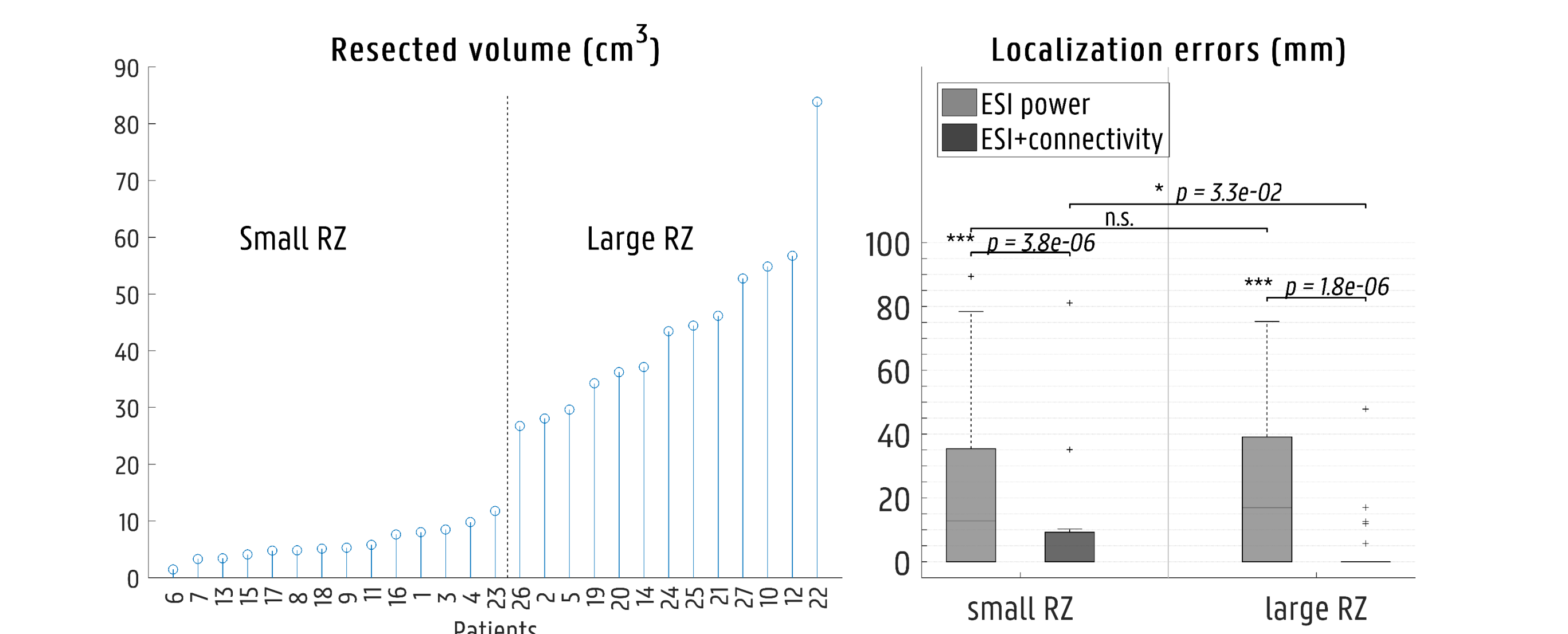


ESI+connectivity outperformed ESI power significantly, it was able to estimate the SOZ with high accuracy.



72% of the seizures were estimated inside the RZ, 94% within 10 mm of the RZ.
For 67% of the patients, all seizures were estimated inside the RZ, and for 85 % all seizures were estimated within 140 mm of the RZ.

The volume of the resected zone had a small influence on the performance.



There was no significant difference for small and large resections in the percentage of correctly localized seizures per patient.

We showed that it is possible to estimate the SOZ from clinical ictal scalp EEG with high accuracy using ESI and subsequent functional connectivity analysis. Given more research, it could be a valuable tool for the presurgical evaluation of epilepsy.